U.S. Department of Transportation

Federal Aviation Administration

Memorandum

Subject:	INFORMATION: Equivalent Level of Safety Finding for Emergency Exit Markings on Boeing Model 7E7 Series Aircraft FAA Project Number TC6918SE-T	Date:	December 15, 2004
		Reg Ref:	§ 25.811
From:	Manager, Transport Airplane Directorate, ANM-100	Reply to Attn of:	George Panger ANM-150S
To:	Manager, Seattle ACO, ANM-100S	ELOS Memo #:	TC6918SE-T-CS-2

The purpose of this memorandum is to inform the certificate management aircraft certification office of an evaluation made by the Transport Airplane Directorate on the establishment of an equivalent level of safety finding for the Boeing 7E7 Model aircraft.

Background

Section 25.811(f) requires a 2 inch colored band to outline the exit doors and the color contrast between the band and the surrounding fuselage surface to be distinguishable. The contrast must be such that if the reflectance of the darker color is 15 percent or less, then the reflectance of the lighter color must be at least 45 percent. When the reflectance of the darker color is greater than 15 percent, then the reflectance difference between the colored band and the surrounding fuselage surface must be at least 30 percent.

Metal door sills are often installed on the fuselage directly below floor-level exits to provide protection from impacts with loading equipment. If the colored band is located on the bottom edge of an exit door, its reflectance must be compared with the metal door sill reflectance to determine compliance with § 25.811(f)(2). This requirement can result in a color scheme which is not desired by the operator. Note that painting the metal door sill is not considered a viable option since impacts with loading equipment cause the paint to scratch and wear away quickly.

As a means to remedy this problem, FAA Policy Memorandum PS-ANM100-2003-115-04, dated April 2, 2003, was issued to allow the colored band to be located a few inches above the base of the exit door and its reflectance compared with the door surface below the band instead of the metal door sill. This results in more color options for operators to choose from in determining a desired color scheme.

For the 7E7 airplane program, Boeing has requested that the FAA grant emergency exit marking equivalent safety findings which are the same as were previously granted on all of its current airplane programs. While memorandum PS-ANM100-2003-115-04 provides one method of

demonstrating compliance with § 25.811(f)(2), Boeing's position is that it does not give all the needed versatility provided by the compliance methods specified in the previously granted issue papers. By receiving these same equivalent safety findings, Boeing feels that they can provide operators with paint schemes that meet their marketing requirements while still meeting the intent of § 25.811(f)(2).

While the method of compliance contained in memorandum PS-ANM100-2003-115-04 is the preferred method to address the non-compliance in the color contrast between the colored band and the metal door sill, the FAA finds that the following alternate method can be used.

If the reflectance difference between the colored band and the metal door sill is 25 percent or greater, then the contrast is acceptable, regardless of the reflectance value of the darker color. If the reflectance difference is less then 25 percent, then the metal door sill can be ignored and the reflectance evaluation can be conducted between the colored band and the fuselage surface below the metal door sill. In this case, a reflectance difference of 30 percent or greater is acceptable, regardless of the reflectance value of the darker color.

Applicable regulation(s)

§§ 21.21(b)(1), 25.811

Regulation(s) requiring an ELOS

§ 25.811(f)(2)

Description of compensating design features or alternative standards which allow the granting of the ELOS (including design changes, limitations or equipment need for equivalency)

The following design features allow the granting of the ELOS for configurations where the reflectance difference between the colored band and the metal door sill is 25 percent or greater:

1. The reflectance difference between the colored band and the remaining fuselage surface areas exceeds the minimum FAA standards. For this case, the remaining areas include the fuselage surface below the metal door sill.

The following design features allow the granting of the ELOS for configurations where the reflectance difference between the colored band and the metal door sill is less than 25 percent and the reflectance difference between the colored band and the fuselage surface below the metal door sill is 30 percent or greater:

1. The door sill height is limited to a maximum of 5 inches at the centerline of the door.
2. The reflectance difference between the colored band and the remaining fuselage surface areas exceeds the minimum FAA standards.
3. If the sides of the door sill extend up above the base of the door, the door sill extension height is limited to a maximum of 4 inches above the base of the door.

Explanation of how design features or alternative standards provide an equivalent level of safety to the level of safety intended by the regulation

Section 25.811(f) requires that a 2 inch colored band outline the exit doors and the color contrast between the band and the surrounding fuselage surface to be distinguishable. The intent of the requirement is to assist rescue personnel outside the aircraft in finding the emergency exits. When the top, right side, and left side of the exit door exceeds the minimum FAA standards, then some deviations from the pertinent regulation are acceptable in the door sill area.

FAA approval and documentation of the ELOS

The FAA has approved the aforementioned Equivalent Level of Safety Finding in project issue papers CS-2 and CS-3. This memorandum provides standardized documentation of the ELOS that is non-proprietary and can be made available to the public. The Transport Directorate has assigned a unique ELOS Memorandum number (see front page) to facilitate archiving and retrieval of this ELOS. This ELOS Memorandum number should be listed in the Type Certificate Data Sheet under the Certification Basis section (TC's & ATC's) or in the Limitations and Conditions Section of the STC Certificate. An example of an appropriate statement is provided below.

Equivalent Safety Findings have been made for the following regulation(s):
§ 25.811(f) Emergency Exit Marking (documented in TAD ELOS Memo TC6918SE-T-CS-2)

Original Signed by
John Sheldon for

Manager, Airframe/Cabin Safety, ANM-115

12/29/2004
Date

ELOS Originated by Seattle ACO:	George L. Panger Jr.	ANM-150S